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# **View from the Lake: Legacies of the Dolores Archaeological Program, SW Colorado**

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## **I. Introduction**

This summer, I cruised McPhee Reservoir in a boat, trying to recognize the locations of archaeological sites that were excavated by the Dolores Archaeological Program (DAP) in the late 1970s and early 1980s. I found myself disoriented much of the time, and it was only with great difficulty that I could relate the familiar geography of the project days to what I was seeing in 1997. Although the filling of the lake has obscured my perspectives of the actual sites, the passage of time has made it easier to gain a more abstract perspective on the contributions made by the work that was done at those sites.

The DAP was one of the largest archaeological mitigation projects ever carried out in the U.S., and was accomplished in several phases or sub-projects. I will focus on the work done to mitigate the effects of the reservoir and dam construction proper, and will refer to this as the Reservoir DAP or RDAP. This part of the project took place in the years 1978 through 1985 (Robinson et al. 1986). Warren Hurley will discuss the part of the project that dealt with the construction of the water delivery system, which has continued until recently.

There were over 1600 sites--most of them prehistoric--in the Reservoir Project area; 101 sites were tested or partially excavated, with 41 of these sites receiving more than one crew week of fieldwork (Robinson et al. 1986). In some years, the project budget rivalled the funds allocated to NSF for archaeological research projects throughout North America. The RDAP made a number of contributions to American archaeology, including : 1) Establishment of an excellent public museum at the Anasazi Heritage Center near Dolores, Colorado, now visited by over 40,000 people a year. 2) Concurrent establishment at the Heritage Center of a well-run repository that makes collections and records from numerous federally-related projects in the region available for continuing study. The museum and repository were built by the Bureau of Reclamation and are operated by the Bureau of Land Management. 3)

Well-ordered RDAP collections, paper records, and a large computer data base, accessible at the Heritage Center. 4) Training of many young archaeologists who continue to work as professionals. 5) Lessons in the effective organization of large-scale, multidisciplinary projects. 6) A number of substantive and methodological contributions to American archaeology. I will focus here only on this last point and ask to what extent the work of the RDAP has improved our understanding of Southwestern archaeology and has increased the power and efficiency of archaeological methods.

This last point is an important one, because the underlying premise of the mitigation of adverse effects through "data recovery" is that information gained through study of the archaeological record can compensate in some ways for the loss of the physical record itself. Therefore, the expenditure of public funds on these projects can be justified only if they in fact lead to an increase in knowledge about the past. The development by such projects of more powerful and efficient ways of learning about the past is another way they can meet their obligations to society. I think the RDAP meets this standard pretty well; below, I'll review what I think have been the most important contributions of the project.

## **II. Principal Archaeological Contributions**

### **1) Understanding Puebloan Culture, A.D. 650-900**

Although the lands in and around McPhee Reservoir have sites of many periods, the bulk of the archaeological record resulted from intensive use of the area by Mesa Verde Puebloans between about A.D. 650 and 900--the late Basketmaker III and Pueblo I periods in the Pecos chronology (Kane 1986a). Although a number of "classic" excavations had focused on this time interval in previous years, (e.g., Morris, Roberts, Martin, Brew, Hayes and Lancaster), the RDAP resulted in a much improved understanding of it. And although evidence to the contrary was produced by some of the earlier workers, this period has consistently been interpreted by most Southwestern archaeologists in terms of a model of gradual, progressive change (cf. Berry 1982). I call it the "Mesa Verde diorama" view of Four Corners archaeology. It goes something like this: Early groups were small, scattered, and nomadic. As they gradually added new traits such as farming, pottery, and masonry wall-building, their communities became progressively larger, more aggregated, more permanent and more like historic period Pueblos. The RDAP results pretty conclusively blew this model away, and in doing so, have helped loosen the grip of similar implicit gradualist models on interpretation of the archaeological record elsewhere in the Southwest.

To make a complex story simple, the RDAP showed that the area was settled in the A.D. 600s by Basketmaker III farmers living in dispersed single family homesteads, each including a large pitstructure with outlying above and below-ground storage structures and other features. In the Pueblo I period, population size and density gradually increased in the late 700s, may have declined in the early 800s (Orcutt et al. 1990; Schlanger and Wilshusen 1993), and then rose very rapidly--almost certainly due to immigration--in the middle A.D. 800s (Schlanger 1986, 1988). The population increase was accompanied by the formation of seven large

villages in the period A.D. 850-880. McPhee Village--the largest--probably had a peak population of 150-200 households (600-1000 people) about A.D. 860-870 (Kane 1986b, 1989, Wilshusen 1991). At the end of the ninth century, reservoir area population declined even more precipitously than it had grown a few decades earlier, and by A.D. 900, the area was nearly or completely unoccupied.

The RDAP also documented a number of changes in architecture and artifact assemblages. Prudden Unit-type habitations become the norm after about A.D. 750, each consisting of a large pitstructure and several associated contiguous surface rooms devoted both to storage and habitation; each such unit appears to have housed one or a few families (Wilshusen 1988). With settlement aggregation, these habitation units become connected side-by-side to form long roomblocks, which cluster in varying numbers to form villages (Wilshusen 1988; Kane 1986b). Wide-mouthed cooking jars become relatively more abundant after A.D. 800 (Blinman 1986b; 1988c); this change, along with the construction of increasingly well-built surface storage rooms, probably correlates with greater reliance on stored maize (Gross 1986, 1987, 1992).

The occurrence of a few "great pitstructures" with elaborated ritual floor vaults in association with distinctive "U-shaped" roomblocks and higher frequencies of traded ceramics in some of the mid- to late ninth century villages indicates a modest level of social differentiation, probably mediated by religious ritual and feasting (Kane 1986b, 1989; Blinman 1989; Wilshusen 1989; Orcutt et al. 1990).

The demonstration of a population boom and bust cycle in the Dolores Valley in the A.D. 800s raised the obvious question of where the settlers came from and where they went. This helped stimulate the RDAP researchers to take a geographically much broader view of settlement and population dynamics in the Four Corners area. Follow-up work to the DAP has shown that a number of village-level aggregates formed in the Four Corners area during the late A.D. 700s and 800s, but that not all were contemporaneous and most were short-lived (Wilshusen 1991; Wilshusen and Blinman 1992). This suggests that some communities either moved more or less intact, or that their inhabitants dispersed and joined existing or newly-forming villages. Large-scale community mobility may have been associated with a farming pattern that resulted in fairly rapid resource depletion, in the context of relatively low regional population density that permitted communities easy access to new lands (Kohler and Matthews 1988; Kohler 1992a).

Recent work also indicates that the movement of people out of the Dolores Valley in the late A.D. 800s was part of a larger pattern. The A.D. 900s appear to be a time of very low population in the northern San Juan or Mesa Verde region (Wilshusen and Schlanger 1993; Wilshusen and Wilson 1995). Although this remains speculative, the area that seems most likely to have received these emigrants is the San Juan (geologic) basin of northwestern New Mexico, where they may have contributed to the emergence of the Chaco phenomenon.

## **2) Reconstruction of Past Environmental Conditions**

Ken Petersen and his co-workers in the DAP Environmental Archaeology group did a masterful job of developing a model of past climatic change and relating it to physiography and agricultural conditions in the reservoir area (Petersen 1986, 1987a-d; 1988; Petersen and Clay 1987). The climatic model was based primarily on non-DAP supported studies, which included palynological data from lake cores in the LaPlata Mountains and tree-ring data from several areas of the Four Corners region, plus the Colorado Front Range (for bristlecone pine tree-ring sequences indicative of temperature variations). Additional relevant palynological data were obtained in the project area from Sagehen Marsh, which also showed an increase in charcoal during the A.D. 600s, suggesting that the initial BMIII period settlers were using fire to clear fields. Using these data, Petersen and colleagues reconstructed annual precipitation, summer precipitation, and summer warmth, as well as the effects of physiography on cold-air drainage and pooling. Taking into account elevation, exposure, and cold-air drainage, Petersen proposed episodic changes in the width of the "dry-farming belt" in southwestern Colorado from the late A.D. 500s through 1300 (Petersen 1987d). Data on frequency of drought and short summers also enabled measures of agricultural costs and stresses to be created (Orcutt 1986, 1987; Kohler et al. 1986).

The RDAP model of environment and subsistence potential showed generally good agreement with the main contours of project area population and settlement (Schlanger 1986, 1988). In particular, the eighth and ninth centuries showed declines in annual precipitation that would have made the high elevation environs of the Dolores Valley attractive for farmers, relative to a number of other parts of the northern San Juan region. Severe drought in the very late A.D. 800s and early 900s, coupled with probable short growing seasons in the early 900s, may have contributed to the abandonment or near-abandonment of the reservoir area at that time (Petersen 1988). The various RDAP studies of subsistence, environment, and population attempted to situate demographic change in the Reservoir area within a larger frame of regional cost-benefit and risk considerations. In other words, even if farming conditions were tolerable in the Reservoir area, they might be better somewhere else; hence, the analysis attempted to consider "pull" as well as "push" factors in the movement of populations into and out of the area (Lipe 1986).

## **3) Understanding Processes of Socio-cultural Change**

The RDAP provided an opportunity for an intensive, multidisciplinary investigation of prehistoric social and economic change over a relatively short time (by archaeological standards) in a small region (Breternitz et al. 1986). RDAP studies showed that population increase in the A.D. 800s was associated with settlement aggregation, intensification of farming, anthropogenic impacts on the local environment, elaboration of religious ritual, and some degree of concentration of social power, though not of the sort that was clearly expressed by individual display of status markers (Kane 1986b; 1989; Lipe and Kane 1986; Orcutt et al. 1990; Blinman 1989). The environmental context for these changes was one in which the Dolores region was attractive for farming relative to adjacent lower-elevation regions, but in which farming was nonetheless risky. In my opinion, the RDAP research

provides one of the best-documented case studies of the interaction of demographic, social, and environmental variables in American archaeology (cf. chapters in Breternitz et al. 1986).

In attempting to find causal factors in the changes observed in the Reservoir area, RDAP researchers attempted to compare "social" and "economic" models (Lipe 1986; Lipe and Kane 1986). The "social" or "sociopolitical" model was based on work by Kent Lightfoot (1984). It saw regional-level competition among emerging leaders and their kin groups as the primary process driving population aggregation, subsistence intensification, and the development of social hierarchy. The "economic" model saw regional resource stress as leading to a concentration of population in the Reservoir area, and hence to subsistence intensification. This and increasing competition for land in turn led to the development of community-level control over land use and conflict resolution, and hence to aggregation and the intensification of ritual.

It proved difficult to develop test expectations that unequivocally distinguished the two models, but the richness and comparability of RDAP data sets did support a number of tests, which had varying degrees of success. Some results supported the economic model, some the social, suggesting that both sets of processes were at work, and that an either-or choice between the models was too simplistic (Lipe and Kane 1986; Orcutt 1986, 1987; Kane 1986b, 1989).

In a larger sense, this work introduced a much-needed empirical case study into the raging early-1980s debate about whether prehistoric Pueblo societies were rigorously egalitarian tribes or represented more complex social formations having strong hierarchical institutions (e.g., Upham 1982; Plog and Upham 1983; Reid 1985). By conducting well-designed studies of multiple lines of evidence, the RDAP produced answers that were more complicated and interesting than either hypothesis had suggested. Since the mid-1980s, studies of Puebloan social and economic change have been less rhetorically strident and more empirically robust. I would like to believe that the RDAP example helped establish this trend.

The RDAP also attempted with some success to move away from prevailing models of organizational change that explicitly or implicitly assumed that changes could be explained by processes operating largely in situ within relatively small regions (such as a river valley or mesa). The RDAP explicitly attempted to relate changes in the project area to those occurring in the broader Four Corners area, and to consider interregional differences in social and economic "push" and "pull" factors that may have influenced population movement.

#### **4) Development of Archaeological Methods**

Several methodological contributions of the RDAP stand out. One was the use of archaeobotanical samples to document changing patterns of firewood and construction timber use as population size and density increased, and as households aggregated into village-sized settlements of several hundred individuals (Kohler and Matthews 1988; Kohler 1992b). Interpretation of these results was facilitated by reconstructions of the probable prehistoric distribution of vegetation in the project area, and of the probable amount of land cleared for farming at various levels of population. Together, these studies supported the inference that

in the A.D. 800s, the large Dolores area population had begun to impact the local environment by depleting certain wood resources, leading to a shift to less desirable species (Kohler and Matthews 1988).

The RDAP also contributed to the use of simulation in the study of social and environmental relationships. Using survey data in conjunction with soil maps, physiography, and reconstructions of climate and agricultural yield, Kohler and others (Kohler et al. 1986; Orcutt et al. 1990) modelled the growth of project area population, starting with settlement by dispersed households. They predicted that as population rose, household agricultural and foraging catchments would increasingly overlap, and that one likely response would be for people to move away from fields into villages, where ritual and political measures to resolve resource conflicts could be maintained. In the simulation, the appearance of a significant overlap in household catchments coincided well with the archaeological timing of population aggregation into villages. In recent years, Kohler, Van West, and others have continued to develop increasingly sophisticated simulations, using archaeological and environmental data from a much larger area of Southwestern Colorado (Van West 1994; Kohler and Van West 1996).

RDAP researchers also did some pioneering work in "accumulations research" (Varien and Mills 1997), i.e., the rates at which various kinds of materials are deposited in the archaeological record to form assemblages. Kohler and Blinman (1987) showed that length of occupation of sites could be inferred from sound estimates of total sherd populations, if number of households and pottery breakage rates were reasonably well known. This paper also discussed ways that long-term assemblages could be "unmixed" by calculating the inputs from different periods required to achieve the observed archaeological assemblage characteristics. Blinman (1988) showed that estimates of standing household inventories of pottery vessels could be estimated if length of occupation and number of households were reasonably well known. Several "graduates" of the RDAP, as well as others, have continued to use RDAP data to carry forward similar research into accumulation rates and assemblage formation processes in recent years (e.g., Schlanger 1990, 1991; Varien and Mills 1997).

The RDAP lab programs in artifact analysis developed a number of methodological improvements and innovations (Blinman 1986a; Phagan 1986). In ceramics, there were important contributions to the use of pottery types, in conjunction with assemblage formation analysis and tree-ring dating, to refine chronologies and to systematize chronological placement of archaeological contexts (Blinman 1986a; 1988a, b, c). There was some success in developing and chronologically calibrating attribute-based seriations (Blinman 1984). Important work was also done in functional interpretation of pottery vessels (Blinman 1986b, 1988b and c) and in determining whether production was at the household or specialist level (Blinman 1988c; Blinman and Wilson 1988). Studies of the interregional exchange of ceramics documented changing patterns through time, and were successful in factoring out changes that were caused by population decline in the trade vessel source areas from those likely due to social or economic factors (Blinman 1986b, 1988c; Wilson and Blinman 1988).

The lithic artifact analysis program developed methods for facilitating comparisons across large data sets and large numbers of archaeological contexts (Phagan 1986). These included the use of broad "morpho-use categories" to characterize assemblage variability across time periods, and to identify functionally different contexts at the site and intra-site levels (Phagan 1986). Comparisons were assisted by use of standardized graphs of flaked and non-flaked lithic tool assemblage profiles and by indices of assemblage diversity and tool production cost. Systematic identification of lithic raw materials permitted analysis of variability in materials by sub-phase, tool morpho-use category, and functional site type. In addition, a multivariate analysis of projectile point form permitted comparison of statistically-derived and intuitive point typologies (Phagan 1988a and b). The large sample of excavated contexts provided by the RDAP fieldwork also enabled the analysis of changes in lithic toolkits associated with households and spatially clustered groups of households, across the transition from a dispersed to aggregated settlement pattern (Hruby 1988).

## **5) Data Comparability and Quality Control**

The RDAP was able to tackle large-scale problems in processual archaeology and to develop or test important new methods because a serious commitment was made to obtaining comparable, high-quality data. This was not an easy problem, because up to 10 excavation crews were in the field at the same time, and the central analytical laboratory operated for a number of years, with several changes in key personnel.

Several steps were taken to ensure data comparability and quality. The RDAP leadership saw the project as a once-in-a-generation opportunity to obtain the large, controlled data sets from a regional sample of sites that processual archaeology requires (Binford 1964; Struever 1968). But to be useful, these data would have to be comparable; that is, measured differences among contexts would have to be more than just a reflection of different archaeologists' recording style.

First, although most RDAP excavations were designed to sample particular kinds of structures, features, or contexts, a sample of sites was also subjected to probabilistic sampling by standard-sized pits (Kohler and Gross 1984). This permitted the collection of representative samples of artifacts and ecofacts, and to some extent of feature and architectural data, for the main time periods and site types being investigated. The "probability sample" made possible systematic comparison of quantities and rates of deposition of various kinds of material from across the project. These data were critical in a number of project-wide, problem-oriented studies.

Second, the RDAP leadership team invested an enormous amount of effort in developing field forms that required certain kinds of data to be recorded in a certain way. This did not preclude narrative comments, sketch maps, or the like, but for field forms to be accepted by the laboratory, the appropriate blanks had to be filled in with entries that made sense, in terms of the coding lexicon. I think there was a fair amount of overkill in this effort, which put a heavy burden on crew chiefs and assistant crew chiefs, some of whom no doubt still have nightmares about "Fill Assemblage Position" and "Fill Assemblage Type" codes. But the

result was the generation of an enormous amount of detailed and reasonably comparable data on features, architecture, artifacts, and depositional contexts, from both the judgmentally chosen as well as the probabilistically selected excavation units. In addition to the field recording, the lab analysis systems were designed to generate comparable data within each main class of artifacts. Too many variables may have been recorded in some cases, but a serious and continuing effort was made to measure the same things in the same way on each item.

Third, the RDAP made a strong commitment to data quality. The fact that most of the standard field and lab data had to be entered into a computer data base exercised one form of control--if it was not in a form that the computer could recognize, it was probably wrong. More importantly, Lab Director Paul Farley personally examined and approved most of the field and laboratory records before they were accepted for entry into the data base, and had no qualms about rejecting forms that did not meet RDAP standards. This provided an incentive for both field and lab crew chiefs to clean up their data records before they submitted them.

Finally, much effort was expended to develop a comprehensive computer data base, despite the relative primitiveness of the computer hardware and software available in the early 1980s. This database continues to be accessible at the Anasazi Heritage Center and in several copies located at other institutions, and has been used in a number of studies done since the RDAP ended (e.g., Schlanger 1991; Kohler 1992a; Hegmon 1995; Potter ). Fortunately, a recent Colorado Historical Society grant to the Heritage Center will ensure a much-needed upgrading of the documentation, and conversion to a much more user-friendly format, so that it can continue to support new research in the future.

The intrinsic complexity of archaeological data, and the difficulty of recording them accurately and consistently in the field and lab, should make data quality and comparability a major issue in archaeological project design and administration. And many projects accept this responsibility and allocate resources to it, as did the RDAP. However, there is a striking lack of discussion of these aspects of archaeological research, either in print or at professional meetings. Even the RDAP under-reported this important aspect of its work. This is an area where things that were learned by the RDAP have not generally been made available for discussion by the archaeological community. On the other hand, there has been an indirect influence through RDAP's exposure of a cadre of young professionals to high standards for data comparability and quality control.

### **III. Concluding Comments: Dissemination of Results**

I want to conclude by returning to the question I started with--to what extent did the public funds spent on the RDAP result in an increase in knowledge about the American past and an improvement in our ability to learn about the past through the practice of archaeology? I think I have made a case that the RDAP made some important contributions of both sorts. To fully answer the question, however, we must consider how effectively knowledge about these contributions has been disseminated. No matter how good the research has been, if scholars and ultimately the general public never learn about the results, the social benefit of the project



remains unfulfilled. My consideration of the issue of dissemination will necessarily be personal and subjective, although I think it could be addressed systematically through various kinds of citation analysis.

First, the development of the Anasazi Heritage Center as one outcome of the RDAP provided both an immediate and continuing focus for public education, not only about the RDAP itself, but about the archaeology of the Four Corners area. The permanent exhibits are well done, and temporary exhibits regularly bring fresh topics to the public. The Center has worked with the Southwest Natural and Cultural Heritage Association to have several popular books and a video produced about the archaeology of Southwest Colorado. The Center is also home to the BLM's Imagination Team, which is playing an important national role in the development of archaeological education materials, with special emphasis on providing information to K-12 teachers. So the establishment of the Heritage Center has speeded up and facilitated the ordinarily slow process of translating the results of technical archaeological research into forms that the public can enjoy.

Second, the RDAP technical reports were produced in a timely manner. Eleven weighty volumes containing detailed site reports, as well as a number of synthetic and topical studies, were published by the Bureau of Reclamation during the project and shortly after its end, and were distributed to a list of libraries, agencies, and individuals. In addition, over 200 other technical reports were produced and given much more limited circulation. These are available at the Heritage Center in Dolores.

Third, a number of theses, dissertations, journal articles and book chapters have been based on RDAP studies and data. Many of these were written by RDAP personnel during or after the project, and some were originally presented in more detailed and technical form in the RDAP reports. There also has been a continuing stream of more recent articles that follow up on the issues raised by the first round of publications, or that address new questions with data from RDAP collections or the computer database. The funds expended to do the basic fieldwork, analysis, and reporting thus continue to generate contributions to knowledge that are paid for from other sources. These shorter, more widely distributed articles and chapters have resulted in a much broader understanding of a variety of RDAP-related topics by scholars and interpretive specialists than was achieved by the technical volumes alone, which are primarily used by specialists in the archaeology of the region.

Fourth, I think that all of us who are knowledgeable about the project continue to be surprised at how slowly some of the principal substantive results of the RDAP have come to be incorporated into the general literature on Southwestern and American archaeology. The RDAP convincingly and empirically demolished the "uniform gradual progress" model of early Anasazi prehistory, and produced important new insights into early Puebloan adaptive and organizational change, but you would never know it from some of the characterizations of Northern San Juan culture history that continue to appear in print. It is also surprising that although the RDAP has provided some of the most detailed and best-documented site reports for the Southwest, RDAP sites such as McPhee Village or Grass Mesa are seldom used as examples of settlements of the Pueblo I period.

I don't think that there is any evil conspiracy afoot here. It is just that the literature of the Southwest is so enormous that even accomplished scholars quail at the thought of trying to read an 1100-page technical report about a project outside their own research area, let alone 11 such monographs and 200 other unpublished reports. As noted above, detailed documentation of basic project results are an absolutely essential component of fulfilling a project's obligations to science and ultimately to the public; the RDAP reports are remarkably good, were produced in a timely manner, and will probably still be valuable data sources a hundred years from now. However, the problem-oriented articles and chapters that have more recently emanated from the RDAP have been more effective than the technical reports in "making a difference" in scholarly and public knowledge of the project's findings because 1) they are short and 2) they are published in journals and books that are circulated at a broad regional or national level.

In retrospect, I wish that some of the RDAP fieldwork, analysis or technical reporting had been cut back just a bit and some time made available at the end of the project so that key project staff members could have produced one or two compact, book-length syntheses of the project's most important results. Such a book or books would have been addressed to Southwestern archaeologists, but would also have made the project findings more accessible to a variety of public interpretive specialists as well (e.g., journalists, free-lance writers, K-12 teachers, museum exhibitors, video producers, etc.). Publication would have been by a university or trade press, in order to ensure 1) rigorous peer review before publication; 2) aggressive marketing to libraries, the archaeological community, and the interested public; 3) solicitation of book reviews in a variety of journals; and 4) continued availability to scholars, students, and the public as long as the books were still selling. In other words, dissemination of the project's most important contributions to knowledge would have relied on the standard, existing, commercial system that all of us use to find out about what is happening in our field, and to acquire (or have our employer acquire) those books that appear to be worth having.

Of course, it can be argued that the archaeologists who participated in RDAP or who were interested in its results could have produced such a book on their own, and that federal agencies are not responsible for funding anything beyond basic "data recovery" reports. On the first point I would say, yes, it is unfortunate that none of us followed through on this, and I wish that I had taken the lead in doing so. On the second point, however, I would disagree. Obviously, there has to be a limit on how much public money is spent on mitigation projects, and on what it is spent for. But again, the overall goal of a mitigation project is to provide scholars and ultimately the general public with new information about the past, as a replacement for what is lost when the sites themselves are destroyed. If it takes publishing an attractive, readable, peer-reviewed book to ensure that this information actually becomes widely available, that is what should be done. Cut back some of the other components of major projects, if necessary, but don't skimp on ensuring that society gets something reasonably user-friendly for its money, in addition to the required technical documentation reports.

In sum, I think that the RDAP has made and continues to make a significant contribution to our understandings of what happened in the past and to our ability to do better archaeology in the future. The large investment of public funds in this project has paid off in many ways, including direct provision of interpretive materials to the public through the Anasazi Heritage Center, the prompt publication of detailed technical reports and the continued availability of collections, archives, and a database to support new research. Dissemination of the principal substantive and methodological results of the project has had variable success, and might have been improved if a more compact, user-friendly synthesis had been produced at the close of the project and published through standard commercial or academic channels. In future project planning, federal agencies charged with implementing major mitigation projects should attempt to achieve a good balance among their several knowledge-dissemination needs: 1) putting technical documentation on the record, 2) reaching a wide audience of scholars, and 3) providing information to the general public.

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